

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

October 11, 2011

Precipitation and Snowpack

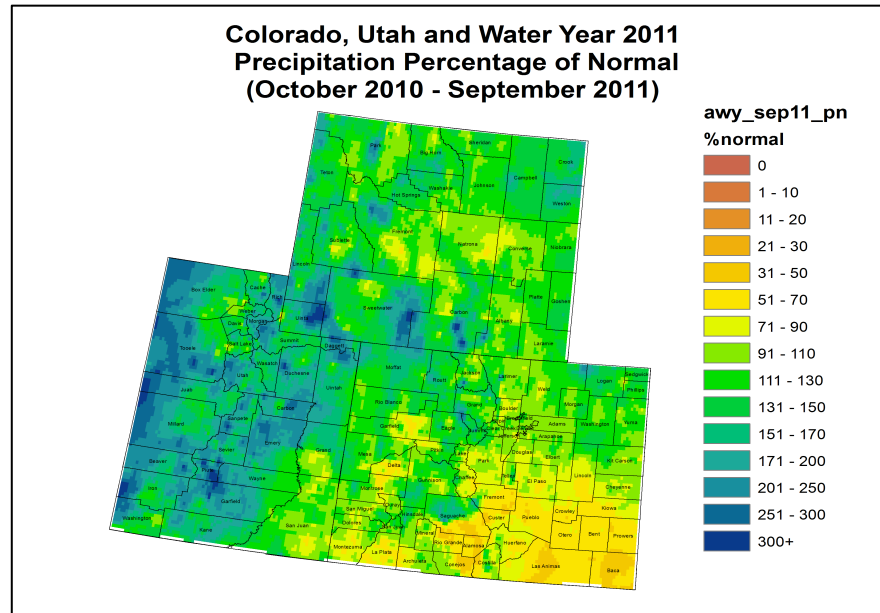


Fig. 1: Water-year-to-date precipitation as a percent of average.

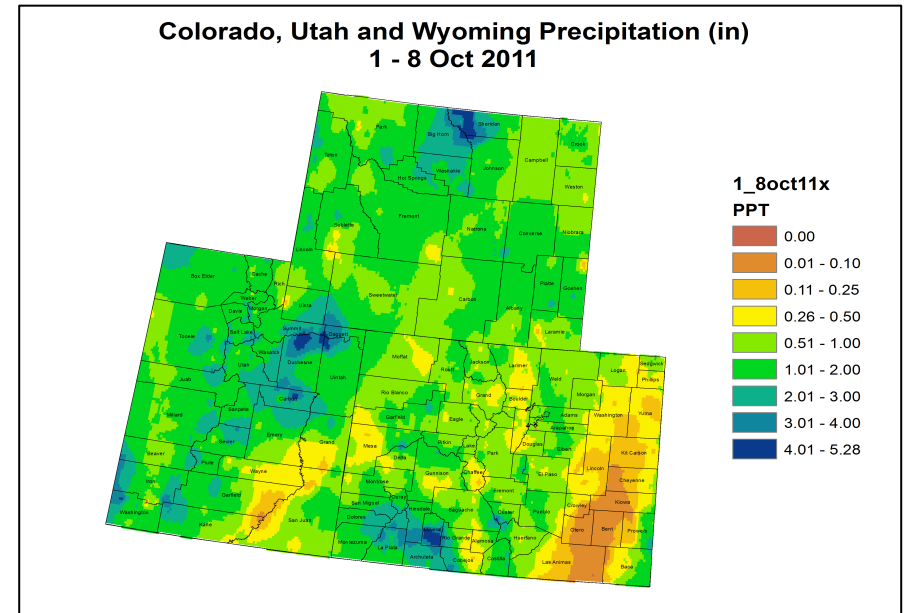


Fig. 2: October month-to-date precipitation in inches.

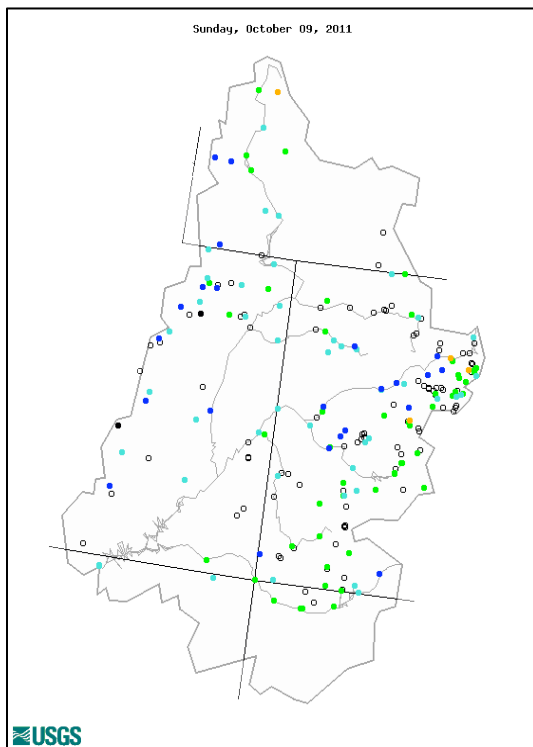
For Water Year 2011, most of the Upper Colorado River Basin (UCRB) received near or above average precipitation (Fig. 1). The Upper and Lower Green River basins were the wettest, seeing nearly 300% of average in some spots, and the Four Corners region was somewhat drier for the water year, with some areas receiving less than 90% of average. East of the UCRB, northeast Colorado saw near average precipitation, while southeast CO and the San Luis Valley were much drier, receiving less than 70% of average in many areas.

For the beginning of October, the northern part of the UCRB and the southeastern portion along the San Juan mountains have received the heaviest amounts of precipitation, with accumulations totalling more than 2 inches, with as much as 4 inches in some isolated regions (Fig. 2). The Four Corners also received beneficial rains, while the Colorado River valley was relatively drier, receiving less than half an inch, month-to-date. Far southeast CO also received beneficial moisture (between .5 to 2 inches), while other parts of southeast CO were drier, seeing less than a tenth of an inch.

Streamflow and Water Supply

As of October 9th, 97% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 3), with 56% of the gages recording flows above the 75th percentile and only 4 gages recording below normal flows. Key gages on the Colorado River near the CO-UT state line and the Green River at Green River, UT show above normal 7-day average streamflows, at the 81st and 91st percentiles, respectively (Fig. 4). The San Juan River near Bluff, UT is showing near normal streamflows, at the 63rd percentile.

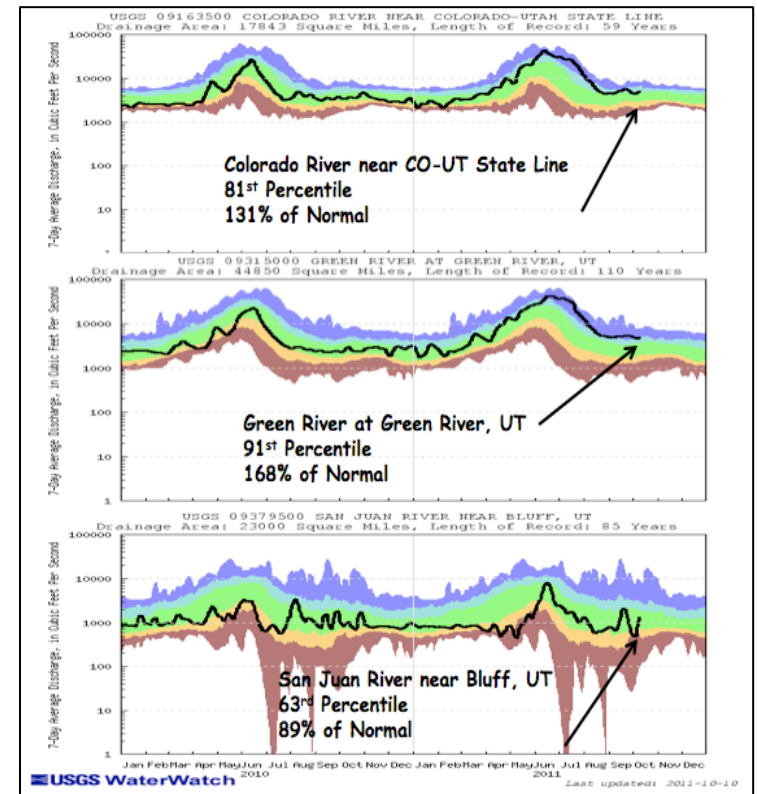
Flaming Gorge, Lakes Powell and Dillon have seen minor decreases since the beginning of October, while Navajo has seen a minor increase. Green Mountain Reservoir has seen a large drop in the first week of the month. All of the major reservoirs, except for Navajo, are well above last year's levels and near or above their October averages. Lake Powell's volume is currently 90% of average and 72% of capacity.



Explanation - Percentile classes							
●	●	●	●	●	●	○	
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Fig. 3: 7-day average discharge compared to historical discharge for October 9th.

Fig. 4: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).



Water Demand

Last week, cooler than average temperatures were observed over most of the UCRB with slightly warmer than average temperatures in eastern CO. With the cooler fall conditions and continuous widespread precipitation throughout the drought stricken areas of southeast CO, water demands have eased and reference evapotranspiration rates (refET) in the San Luis Valley and the Arkansas basin, though still high, have declined.

The VIC model shows poor soil moisture conditions where long term dryness has prevailed for much of the year (over southeast CO) and where short term dryness has popped up in southern WY (Fig. 5). Most of the UCRB shows near average soil moisture with the Wasatch range in UT and the mountains near the Colorado Headwaters showing very wet soils. Near normal to slightly wet soil conditions are showing up in the southern portion of the UCRB. Satellite imagery of vegetation conditions show dry vegetation in the Four Corners region, the San Luis Valley, and southeast CO, though some improvements are showing up in the San Luis Valley. Vegetation conditions are moist for most of the northern part of the UCRB and slightly drier than average in parts of northeast CO.

Precipitation Forecast

The majority of the UCRB will experience dry conditions on Tuesday, except for high mountain locations where a few light showers are possible. Another weak disturbance will pass over the Rocky Mountains Tuesday evening and bring a continued chance of light snow showers to the mountains of WY and northern CO. Precipitation amounts will generally remain below 0.10" of liquid accumulation through Wednesday. On Wednesday dry conditions will expand over the entire UCRB and last into Saturday as a ridge of high pressure builds in ahead of an approaching Pacific trough. This next trough will continue a slow eastward progression through the weekend, with snow showers impinging on the mountains in the far northwestern part of the basin sometime around Sunday. While forecast models are still showing substantial differences in the timing of the trough, expect precipitation chances to increase across most of the UCRB going into early next week.

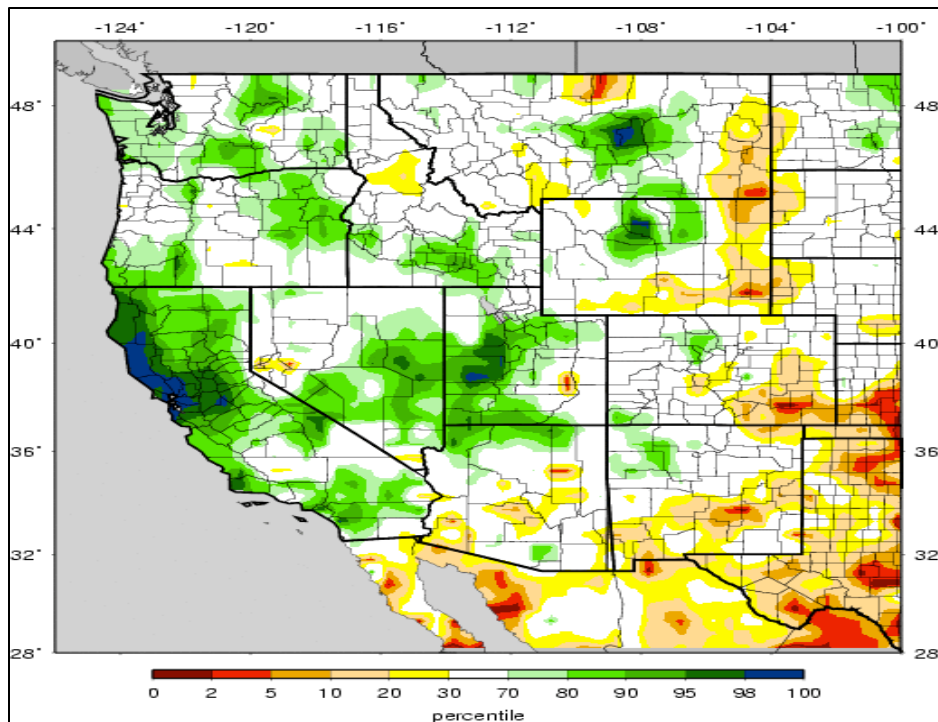


Fig. 5: VIC soil moisture percentiles as of October 9th.

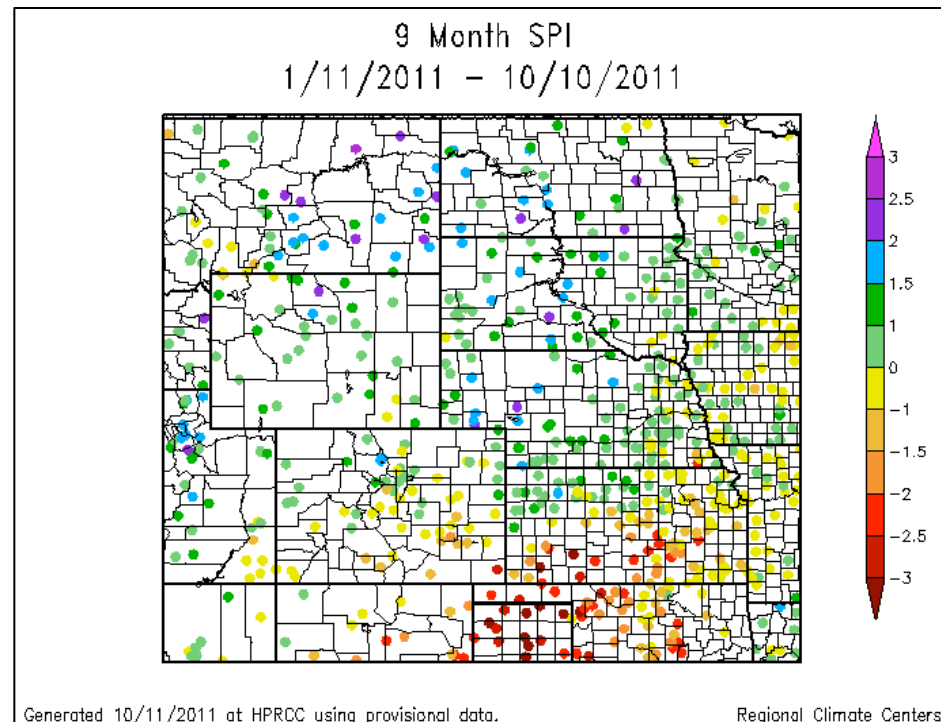
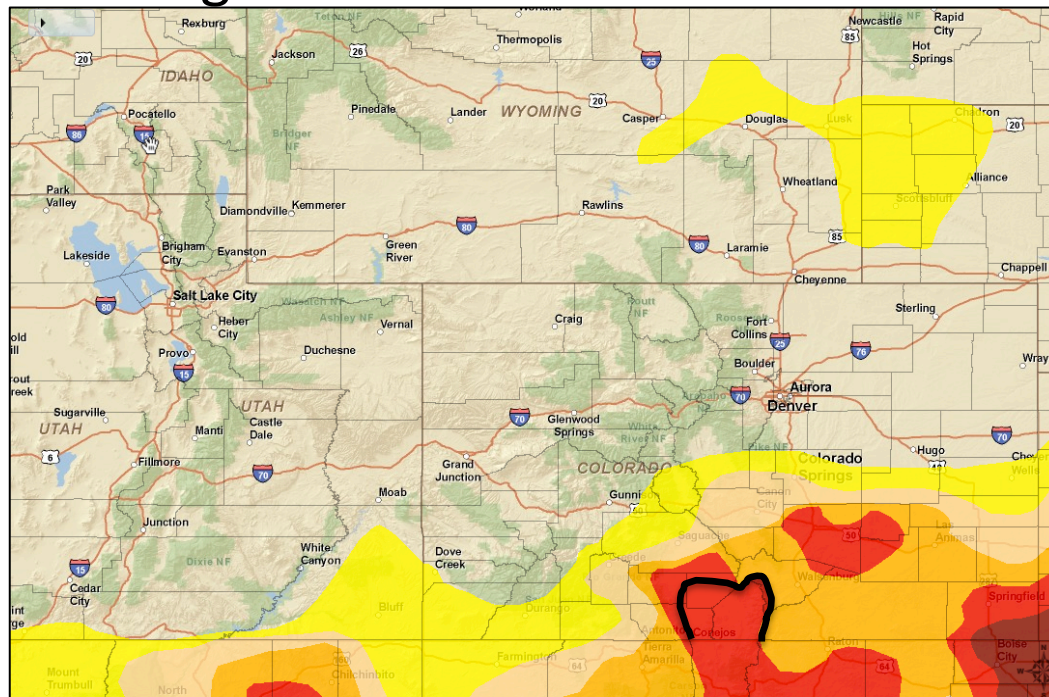


Fig. 6: Standardized precipitation index (SPI) over the region for the 9-month time scale.

Drought and Water Discussion



Drought – Exceptional	0 to 2 (D4)
Drought – Extreme	2 to 5 (D3)
Drought – Severe	5 to 10 (D2)
Drought – Moderate	10 to 20 (D1)
Abnormally Dry	20 to 30 (D0)

Drought categories and their associated percentiles

Fig. 7: October 4th release of U.S. Drought Monitor for the UCRB
 Status quo is recommended this week for the current U.S. Drought Monitor (USDM) map over the UCRB. The past week's moisture accumulations over Sweetwater County, WY have helped alleviate some of the short-term dryness observed there, so no D0 introduction yet. Beneficial precipitation also fell over the Four Corners region, but SPIs still show that D0 is justified in the area on longer time scales (Fig. 6).

In the San Luis Valley, east of the UCRB, it is recommended that the D3 be scaled back on the northern and western sides (following the solid black line, Fig. 7). Many of the areas in D3 west of the valley received over 2 inches of rain in the past week, and soil moisture in the area is showing near normal conditions. Longer term SPIs show that D2 is still justified in the region, but no longer D3.

Also, it may be possible to remove D4 from Baca County, CO now. VIC soil moisture has shown some improvement, and SPIs are less than D4 out through the 6 month time scale. Due to the surrounding D4 in other states, we will defer to the current USDM author as to what will ultimately be done with this D4.